RECOMMENDATIONS TO IMPROVE ENGINEER MAJOR PROFESSIONAL DEVELOPMENT FOR THE OBJECTIVE FORCE

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The opinions and conclusions expressed herein are those of the student author and do not necessarily represent the views of the U.S. Army Command and General Staff College or any other governmental agency. (References to this study should include the foregoing statement.)

ABSTRACT

RECOMMENDATIONS TO IMPROVE ENGINEER MAJOR PROFESSIONAL DEVELOPMENT FOR THE OBJECTIVE FORCE, by MAJ Joseph E. Staton, USA, 92 pages.

The Army as a whole faces both technical and social challenges. The mutual support of institutional training, operational assignment, and self-development is more important now than ever. Mentorship is the glue that binds these three areas to build effective future leaders; primarily from superiors (rater and senior rater), but also from peers and, in some cases, subordinates.

This research focuses on the Army leadership development model to develop midgrade engineer officers for the future. Each area of leader development is examined to determine the independent and mutually supporting values. A pilot survey captured opinions of engineer majors and lieutenant colonels to evaluate the current effectiveness of the three pillars.

Conclusions show the future success of OES will depend on commanders, as mentors, investing more time to develop their officers. It is the commander's responsibility to develop the officer for the broad range of engineer missions and functions. As mentor, the commander must juggle operational requirements against the individual's self-development needs; and at times be willing to sacrifice resources to develop officers for follow-on and future assignments. Commanders will no longer develop officers only for current assignment requirements, but also for the individual and Army's long term plan.

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ACRONYMS

ADL	Army Distance Learning
AWC	Army War College
C2	Command and Control
CARL	Combined Arms Research Library
CAS3	Combined Arms Service and Staff School
CCC	Captains' Career Course
DA PAM	Department of the Army Pamphlet
DDE	Deputy District Engineer
DPW	Director of Public Works
DOTLM PF	Doctrine, Organization, Training, Leader Devebpment, Materiel, Personnel, and Facilities
DTSS	Digital Terrain Support System
FM	Field Manual
M/CM/S	Mobility, countermobility, survivability
OES	Officer Education System
S3	Operations Officer
TRADOC	Training and Doctrine Command
UA	Unit of Action
USACE	United States Army Corps of Engineers
UE	Unit of Employment
USAES	United States Army Engineer School
XO	Executive Officer

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CHAPTER 1

INTRODUCTION

> Just as the diamond requires three properties for its formation--carbon, heat, and pressure--successful leaders require the interaction of three properties--character, knowledge, and application. Like carbon to the diamond, character is the basic quality of the leader . . . But as carbon alone does not create a diamond, neither can character alone create a leader. The diamond needs heat. Man needs knowledge, study, and preparation . . . The third property, pressure--acting in conjunction with carbon and heat forms the diamond. Similarly, one's character, attended by knowledge, blooms through application to produce a leader (1999, 1-2).
>
> General Edward C. Meyer

As the Army transforms to the Objective Force, the engineer battalion will not exist as we know it today. Brigade-sized unit of action (UA) maneuver units may only have a brigade staff engineer section for support. Currently, the battalion operations officer (S3) and executive officer (XO) positions are the premier branch qualification assignments for lieutenant colonel and consideration for battalion command. To meet future challenges and to transform with the rest of the Army, the engineer branch proponent must consider modifying the current professional development track for engineer officers.

The Engineer Branch strives to assign the right officer, in the right place, at the right time in their career. As Army leadership assesses leader development programs for the future it needs to recognize the diversity of the engineer officer. Engineer major assignments vary far and wide from tactical assignments (mobility, countermobility, survivability, demolition, topography, and troop construction) to technical application (facilities engineering, public works, and military construction). The Army must adapt its

leader development program to recognize and acknowledge impending changes from the Objective Force.

Research Question

The primary question for this thesis is, As the Army transitions to the Objective Force, how will the Army leadership development model develop midgrade engineer officers for future assignments? In order to answer this question, the Army must look at the promotion requirements to lieutenant colonel, the probable UA organization, and the three pillars of leader development (institutional training, operational assignment, and self-development).

1. What institutional training changes are necessary for midgrade officers to be successful in the future? Institutional training includes all of the branch specific training and education leaders receive. It also provides the foundation for future development. But under the current training plan, engineer specific training ends with at the Captains' Career Course (CCC). It is also important to determine if and what training is necessary at each grade and how that training can be accomplished.

2. Does the Army rely too heavily on the individual officer to self-develop in the leader development model? Unlike institutional training, self-development is continuous throughout one's career, and as the name implies, it is the responsibility of the individual officer. More often than not, self-development is not enforced and not mentored. As officers prepare individual development plans, they must interrelate with both the grade of the officer, civilian and military education requirements, and current and future operational assignments.

3. The third pillar, operational assignment, is placing institutional training and self-development into operation. What is the appropriate midgrade engineer operational assignment for future development? This question is important because, what is the Army preparing engineer officers for (battalion command or Director of Public Works (DPW) or District Engineer)? When should USAES change the engineer leader development program to support the Objective Force? What should a UA engineer officer do to support the unit? Three positions are discussed throughout the research: engineer battalion S3 and XO, Deputy District Engineer (DDE), and Special Forces (SF) Group Engineer. Differences in engineer major assignment requirements can be described through survey respondent comments and officers serving in these positions. These questions will be answered through evaluation criteria from the engineer functions: mobility, countermobility, survivability, general or sustaining engineering, topography, facilities, security engineering, engineer command and control, and U.S. Army Corps of Engineers (USACE).

Background

As the Army develops the Objective Force, the Corps of Engineers must consider looking at different ways to qualify majors for promotion and meet assignment needs. Several options are available. First, continue with the present development system. Second, split the branch into technical and tactical fields, developing officers for specific roles early in their career. Third, as the Army transforms, develop an innovative method for just-in-time training to prepare officers for upcoming assignments.

Leaders are a product of their upbringing (education, training, and experience). Engineer officer organizational leaders (battalion commanders through District

Engineers) have generally served in the Army for approximately eighteen to thirty years. Much of engineer officer education and assignments are oriented on tactical units and developing future battalion commanders. On any given year there are approximately twenty-two battalion command equivalent positions: sixteen of them are tactical battalion commands and six are district engineer positions. Army engineer doctrine must refocus and develop midgrade engineer leaders prepared to tackle tactically and technically demanding assignments.

Each branch and officer grade has specific requirements for promotion to the next higher rank. These requirements are categorically called 'branch qualification.' Although U.S Army Personnel Command, Engineer Branch has stated that newer, unlisted branch qualifying positions (SF Group Engineer, separate brigade engineer, and Ranger Regiment Engineer) will receive "branch qualified" credit, the positions are not listed in the current DA PAM 600-3. Even with promotion board special instructions, board members do not necessarily recognize Engineer Branch's good intentions. Currently, DA PAM 600-3 states that armored cavalry regimental engineers, brigade and battalion XO, Brigade and Battalion S3, DPW, and DDE offer engineer majors the opportunity for branch qualification (1998, 86).

The Army is committed to developing future leaders at every level. Through progressive, sequential, and continuous education, officers develop skills, values, and attributes necessary for positions of increased responsibility. For too long, the Army has used a cookie cutter approach to developing senior grade officers. Unlike armor, infantry and field artillery, not every branch needs to prepare every officer for battalion command.

Many engineer jobs are battalion command equivalent, but oriented to public works and military construction.

To meet this challenge, the Army uses the three pillars of leader development (institutional training, operational assignment, and self-development), molding leaders for the future. The Army school system is a progressive formal education system to prepare soldiers for job-related and leadership skills. Then the schoolhouse experience is applied through on-the-job experiences and by watching leaders, peers and subordinates. Self-development's goal is to increase soldier's readiness and potential for positions of increased responsibility. Each of the pillars must contribute equally to produce officers with mental toughness; tactical, technical, and conceptual skills; employment of sound judgment; and development of subordinates.

Assumptions

Three critical assumptions are initially made to form the basis of the thesis. Although these assumptions are subject to modification or rejection based on discovered research, all, at this point, appear necessary and valid.

First, within the Objective Force framework, the engineer presence will change dramatically. Engineer battalions may not exist as they do today at the unit of engagement (UE) level, but as a resource pool of combat, construction, and bridging assets to meet the UA maneuver support requirements. But, it must be assumed that each maneuver echelon will continue to require engineer advise the maneuver commander across the entire spectrum of available support.

Second, it is required to assume that the future Army will continue to require some engineer presence at every organizational level. Although technological advances

may replace some engineers on the battlefield, commanders will continue to rely on engineer expertise and advice. Engineers will remain the commander's expert on mobility, countermobility, survivability, topography, mines and demolition, facilities, military construction, and security engineering.

Third, the engineer officer will receive the proper mix of tactical and technical assignments to be successful at any appropriate echelon. Currently, institutional training is primarily focused to produce future battalion commanders. Over 50 percent of engineer school curriculum is focused on tactics. Additional requirements not currently taught include: the Army Planning, Programming, Budgeting, and Execution System; the Program Objective Memorandum process; and programming military construction projects.

Definitions

The definitions and terms used throughout the thesis are critical to understanding, but are also critical to answering the research question. The terms that are integral to this research are defined as follows.

Branch qualification refers to a mastery of skills, knowledge and attributes expected of an officer for his grade in a specific branch. It is also the requirements at each rank required for promotion to the next higher rank or positions of greater responsibility. Branch is a grouping of officers that comprises an arm or service of the Army and is the specialty in which all officers are commissioned, trained and developed. Traditional engineer branch qualification positions are the battalion S3 and XO. This thesis will deal almost exclusively with engineers and PERSCOM Engineer Branch.

Branch developmental position is a nondoctrinal term referring to assignments or positions that meet minimum branch qualification requirements. Officers that are placed into "developmental positions" are encouraged to seek a battalion S3 or XO assignment to increase the chances for promotion. Positions that are loosely considered "developmental" are SF group engineers, deputy district commanders, separate brigade engineers, Ranger Regiment engineer, and assistant division engineer.

Engineer expert is the commander's single reference point on all engineering matters. Engineer function expertise includes: mobility, countermobility, survivability, general or sustainment engineering, topography, mines and demolition, security engineering, facilities, and military construction.

Objective Force is the postulated force of the future Army, circa 2020. It is characterized by knowledge, speed, power and agility, which exceed capabilities of the current force. The research for the Objective Force is focused on four broad areas: geopolitical realities, evolving military art, technology, and human and organizational restructure.

Limitations

This research will focus on designing a complete branch qualification model for future engineer majors serving as brigade-level engineers in the Objective Force. Furthermore, the thesis will focus on challenges to the Army's leadership development process, recognizing that direct leadership and strategic leadership will also be challenged as the Army continues the transformation process. Of particular concern is the Army's use of leadership doctrine in preparing engineer midgrade officers for the innovative and adaptive leadership requirements.

The Army has established officer career fields: operations, operations support, information operations, and institutional support. The research will be limited to engineer support within the Operations Career Field.

The Army uses the three pillars of leader development (institutional training, operational assignment, and self-development) to mold leaders for the future. All three pillars will be addressed and try to determine if the pillars are independently supporting leader development or if they are mutually supporting. Comparison of operational assignments will determine the final outcome of the thesis. The battalion S3 and XO positions are considered the premier branch qualifying jobs for almost every branch and provide an established base for comparison.

Another limitation is the future. In order to test and evaluate any conclusions, data must be evaluated against existing norms. Many engineer branch-qualifying positions are new and data is incomplete to compare against traditional branch qualification jobs.

Delimitations

The thesis must be concise and remain on the central theme. Several areas may be related and warrant further study, but do not fit into the parameters of the paper. The thesis will not consider engineer major branch qualifying positions outside of the SF Group engineer, engineer battalion S3 and XO, and the deputy district engineer positions. The thesis will not delve into how the engineer branch assesses officers into the branch. I will also not research if the engineer branch discriminates against officers without technical backgrounds during selection to lieutenant colonel or colonel. This study will not consider how the engineer battalion will fit into the Unit of Engagement structure.

Finally, the research will not discuss how installations prioritize and select officers for branch qualifying positions.

Significance of the Study

This study holds significance for several reasons. First, this study is intended to highlight engineer transformation leader development requirements. The current Army leader development model shows three pillars that are not mutually supporting. Under FM 7.0, the three pillars Chief of Staff is pushing to field the first Objective Force unit in 2008. Second, without modernization and adaptation to a changing Army organization, engineers will become obsolete. Finally, it is imperative that the Army implement a program where officers can reach-back to the schoolhouse for just-in-time training. Finally, leader development depends heavily on self-development now, and the dependence will be even greater in the future.

Summary

In summary, this thesis is designed to assist senior leaders determining the most efficient and promising methods for developing junior engineer field grade officers for future assignments within the Corps of Engineers. By applying a framework of established functional contributions, this thesis will allow leaders to make informed improvements in midgrade officer positions; improving morale, well-rounded maneuver support and warfighting capability. References supporting this thesis are reviewed in chapter 2.

CHAPTER 2

LITERATURE REVIEW

Initial literature supporting this thesis encourages a look at four central issues. First, the literature sources outlining the requirements for branch qualification and promotion to lieutenant colonel within the engineer branch must be established. Secondly, determination of the institutional training impact and how it prepares midgrade officers for future positions. Third, the importance of self-development and its current impact and future requirements should be considered. Finally, the doctrinal literature describing how officers develop and exhibit future potential through operational assignments must be determined. These four areas provide the background and historical perspectives for increasing subject depth as the research develops.

Six imperatives provide leaders and individuals a common base for evaluation and mentorship. Alone, these principles serve as the framework for development, evaluation, and promotion for not only the individual officer, but also the commander, and branch manager. First, FM 1, *The Army*, provides the doctrinal basis for the Army, and therefore leader development to learn and apply the doctrine. Second, leader development must be responsive to an ever-changing environment. Third, success is measured by contribution to the Army. Fourth, high-quality soldiers deserve high-quality leaders. Fifth, leaders can be developed. Sixth, the officer (self-development), the commander (operational assignment, mentorship) and the schoolhouse (institutional training) equally share the responsibility for developing leaders at every level (DA PAM 600-3 1998, 4).

Before going on, it must be understood that the Army is not planning to change the current development triad for the future. What will change is how the three pillars support each other to develop the leader versus independent contribution to leader development. Another change is the emphasis of Army culture, values, ethics, standards, warrior ethos, and principles and imperatives surrounding leader development at all times (FM 7.0 2002, 1-6). Soldier and leader development in the Army of 2015 will still follow the same institution, assignment, and self-developmental model. Self-development in the future will have a greater emphasis than today. Distance learning, and Objective Force systems will require officers to manage their time to remain self-aware, flexible, adaptable, and technically and tactically competent (OF White Paper 2002, 8-9).

Branch Qualification and Promotion

Establishment of the framework for officer development and career progression begins with DA PAM 600-3, *Commissioned Officer Development and Career Management.* The pamphlet provides the institutional background for officer career management, and more specifically, engineer major branch qualification. As a professional development guide for leaders and individual officers, the reference also provides the basic developmental steps (education, promotion policies, and evaluation) for promotion preparation.

Branch qualification indicates the officer has mastered skills, acquired knowledge and demonstrated attributes expected of an officer at that grade. For captains it is the successful completion of the career course and a successful company command. Majors follow a similar path. Branch qualification comes after receiving credit for a Command and Staff Course, and a successful tenure in a key staff assignment with troops (DA PAM

600-3 1998, 7-8). Normally for majors, this key position is battalion S3 and XO over a twenty-four month period. Time in the grade of major is fast and furious. Each officer must complete a Command and Staff Course and complete branch qualification in an appropriate position for at least twelve months before the lieutenant colonel's promotion board meets for his or her year group.

The promotion process is singular for all officers on active duty and in the same competitive category. It also provides a structure and predicable timelines for tenure and retirement. The system does make adjustments for fluctuations in year group and branch population requirements (DA PAM 600-3 1998, 21). Majors are selected for promotion by a centralized selection board. Each branch identifies the "minimum promotion requirements" to maintain the proper mix of skills and grades within the Army's ranks. Selection is generally based on demonstrated competency and performance potential to serve in positions of increased responsibility (DA PAM 600-3 1998, 22).

Retired General Gordon Sullivan states in his book, *Hope is not a Method*, that evaluation of potential is difficult because it is usually based on past performance. As people gain seniority in an organization, it becomes increasingly easier to see potential. He goes on to establish "two-up and two back." Leaders should rate officers on their potential for success two positions higher than they currently hold. And, when looking for successors, leaders should look at the officer population two levels back (1997, 125-6). The Army generally does this, as majors are evaluated on potential for brigade command (two levels ahead), and selected for promotion by a board of colonels (looking two levels back).

Institutional Training

To assist officers to realize their maximum potential, proponents develop branch-specific training plans to "develop and evaluate skills, knowledge, and behaviors" (DA PAM 350-58 1994, 19). The OES provides sequential education and training as officers display the knowledge and maturity for greater responsibility and promotion. It is not only a leadership development pillar, but also a base for commanders to "build, mold, and shape leaders" for tomorrow. Institutional training also provides the foundation for individuals to self assess, choosing how they approach their career path (DA PAM 350-58 1994, 19).

Through the Officer Education System (OES), officers receive training from several institutions. A normal institution training path consists of a basic officer course (OBC), an advance course or Captains Career Course (CCC), Command and Staff College (CSC), and senior service college. There are other courses available based on need and timing in an officer's career (DA PAM 350-58 1994, 37). For example, an Army engineer may take technical courses through the U.S. Army Corps of Engineers that are not part of mainstream officer education or are only required for small populations.

The US Army Engineer School has been developing OES to meet future challenges. They recognized early on that officers will have less time to devote to a broad-based engineering education. To meet this challenge, engineer OES will focus officers through modular instruction, providing only those modules required for their next assignment (combat or construction engineering). If officers change positions the additional modules can be taken through distance learning and brief on-site training at

USAES. This narrow training technique will place greater emphasis on operational assignment variety and planned and focused self-development. Without mentorship and variety of assignments, officers could become singly tracked (combat or construction) and not retain the vital ability to provide the maneuver commander with full-spectrum engineer capabilities on the battlefield.

The pillars of leader development cannot go understated. Specifically when dealing with the institutional pillar of leader development, developing leaders who can discuss, experience, and teach leadership may have the highest payoff. Those who are only able to read, hear, and see as their method of learning leadership gain far less value from the experience. This also applies to the operational pillar as developing leaders instruct subordinates during training. The Army must incorporate methods that provide the highest payoff at the earliest point in the officer's career and continue leader development throughout the term of service (FM 22-100 1999, 5-14).

By 2015, institutional training will move away from geographic centers. Distance learning will provide "the right education and training on demand, to the right individual, at the right time, at the right place" (OF White Paper 2002, 10). Distance learning should provide officers with the necessary training when they need it, and minimize the impact on families. This change will place greater responsibility on the unit commanders to determine who and when officers can attend training (OF White Paper 2002, 9-10). If soldiers are expected to participate in distance learning while performing regular daily duties, commanders will have to make time for professional development, less the impact and turbulence on personal and family time will be greater than moving to a geographical institution. Each education module of the USAES OES transformation plan includes

distance learning. The 'foot in the door' is an unwritten contract with commanders to provide a quality experience that directly impacts the unit. Once these officers have a positive effect then commanders will have a greater tendency to allow officers to participate in independent study during duty hours (Bedey interview, 2003).

Normally, institutional training is the first indoctrination education an officer receives at each grade. It lays the foundation for operational experience and self-development. The institution gives leaders a perspective to develop critical thinking skills and leadership characteristics to overcome future challenges. It is the opportunity to inoculate new leaders with doctrine, providing a springboard for innovative approaches to problems over a broad spectrum of operations and a basis for further self-development (FM 7.0 2002, 1-7).

Self-development

Field Manual 22-100, *Army Leadership*, provides the foundation for continued professional growth through self-development. Institutional training and operational assignments do not completely develop leaders. To be effective, the individual must decide what character, knowledge, and capabilities need further development for continued professional growth. This is not meant to be an individual effort.

DA PAM 350-58 states: "Self-development is a planned, competency-based, progressive and sequential process . . . to enhance readiness and potential for progressively more complex and higher-level assignments" (1994, 31). Self-development is a continuous process, taking place throughout a leader's career. It is also not an individual effort, but a 360-degree assessment involving superiors, peers, and subordinates alike. Each individual must develop a structured plan with his supervisor to

meet the individual's personal development requirements for current and future career plans (DA PAM 350-58 1994, 31).

Each leader should list out "immediate, near-term, and long-range development goals" (DA PAM 350-58 1994, 31). Immediate goals cover the current duty assignment. It should be the supervisor and individual's intent to correct skill, knowledge, and behavior weaknesses and reinforce strengths. Concurrently, the supervisor should focus on near-term goals; those goals the officer needs to focus on in the current grade. It is not enough to evaluate future potential based on current assignment alone. Through mentorship, observation, and experience leaders can prepare for the next duty assignment. The rater, senior rater, and mentor help leaders focus on long-range goals: the next grade to retirement. Each officer can outline their immediate, near-term and long-range career goals on a single sheet of paper to include timeframe, schools, promotions, duty positions, and duty location (DA PAM 350-58, 31). This becomes a powerful mentoring tool by providing a window into an officer's aspirations.

Retired General Gordon Sullivan believes leaders must have a plan to develop subordinates. It is difficult enough to pick individuals for future promotion, and the leader is usually forced to base potential on past performance (Sullivan 1997, 125-6). No one really knows who will be the best choice for future assignments. Leaders must develop all of their subordinates to become the best they can be, and consider the individual's future potential, not only for the Army, but also for the individual officer's personal goals (FM 22-100 1999, 5-16).

Even in the civilian sector, leaders have a large impact on their subordinates. In *Bass and Stogdill's Handbook of Leadership*, it suggests that subordinates' performance

can be enhanced by outlining their purpose and objectives; “explaining how to meet expectations”; spelling out criteria for performance evaluation; providing effective feedback; and rewards for meeting objectives (Bass 1990, 263). Not surprisingly, these five objectives look like the Noncommissioned Officer Counseling Form, DA Form 2166-8-1. Furthermore, effective mentorship is critical to develop subordinates, as they will pattern their work habits and ethics from their superiors. Greater occurrences of leader-subordinate interaction lead to higher levels of leader patterning by subordinates (Bass 1990, 264).

Looking from the other side, as leaders develop subordinates for the future, subordinates provide a reflection of effective leadership. Mission completion, and subordinate job satisfaction display the effectiveness of a leader’s capabilities. Just being surrounded by successful subordinates does not necessarily equate to an effective leader. Either the leader is working with subordinates that already reflect his personality, or the leader does not possess the abilities to effectively mentor subordinates to follow (Bass 1990, 265-266).

The self-development pillar indeed permeates the other two pillars of institutional training and education, and operational assignments. Although self-development is not as rigorously observed and developed, it could easily be viewed as the most important element for future organizational leader excellence. The leader development program characteristics of battle-focused, comprehensive, inclusive, and supportive serve as an effective model to develop adaptive leaders for future challenges.

Operational Assignments

As a commitment to developing future leaders, the Army is supposed to provide leaders the opportunity for positions of increased responsibility. Throughout an officer's career, his character and competence are continually molded and evaluated to be trainer, role model, and standard-bearer. The development is progressive, sequential, and continuous throughout one's career. The Army of 2015 will train-alert-deploy vice the current alert-train-deploy. Unit training will evolve to include Objective Force systems with embedded training. Each training event will provide realistic simulation, build teamwork and unit cohesion, and provide "virtual and constructive tools" to learn from mistakes (OF White Paper 2002, 10).

The Objective Force White Paper clearly outlines the future force structure in 2015. "The Objective Force in 2015 is an Army of hybrid capabilities including five Units of Employment, fifteen Units of Action, six Stryker Brigade Combat Teams, two and one third Digital Division Corps, and a combination of heavy, light, and specialty forces brigades (airborne, air assault, and Special Forces), [U.S. Army Reserve] units, and four Multi-Functional [Army National Guard] Divisions" (2002, 1). These changes alone give great insight into the future engineer force structure required to support the Army. Depending on the unit chosen and the UE engineer support, the number of active duty combat engineer battalions could be cut in half.

Operational assignments take the institutional education and place it into practical application. The basic skills, knowledge, and behaviors gained in a schoolhouse must be tested and enhanced so a leader can fully develop. "[Practice] refines skills, broadens knowledge, and shapes behavior" (DA PAM 350-58 1994, 25). The supervisor must

ensure that all leaders in his charge are synchronized to maximize their limited time for development. Each commander should have a program that focuses on “sharpening developing leaders’ skills, knowledge, behaviors, and experience” (DA PAM 350-58 1994, 25). The program may include mission oriented leader training, a rotation at a combat training center, emphasis on the leader development pillars, and professional readings.

The commander must be directly involved with leader development. As the unit mentor, he is the one person deciding the fate of his officers’ assignments, training, and ultimately, retention in the Army. Mentorship is critical to self-development. Noel Tichy states in *The Leadership Engine*, “winning companies win because they have good leaders who nurture the development of other(s)” (1997, 3). Commanders can leave subordinate leader’s growth to chance, but more often than not, it is like a ship without anyone at the wheel. Experiences in the operational environment develop leaders and allow them to learn and perform their current duties, but leadership development cannot be left to chance.

Operational assignments should develop organizational core competencies. Throughout the literature, it is clear that the Army’s leadership development framework is a dynamic and complex process. Kenneth H. Pritchard advocates a competency-based system of leadership development doctrine. The core competencies he includes are: tactical, technical, and technological proficiency; cognitive skills and abilities (numerical comprehension, oral communication, and problem solving); interpersonal skills and abilities (human relations and teamwork); and personal characteristics, such as decisiveness and tenacity. The differentiating competencies are interesting: continuous

learning, awareness, flexibility, resilience, initiative, creativity, entrepreneurship, influencing others, partnering, and organizational commitment (Pritchard 1999, 24-25).

The conventional Army engineer in the grade of major will advise the maneuver commander on engineer effects on current and future operations by preparing the engineer battlefield assessment. He does not do this alone, but in coordination with all other battlefield operating systems to include the maneuver operations officer, fire support officer, and the intelligence officer. The engineer must be integrated into the battle staff to be effective. The engineer is the maneuver commander's expert on mobility, countermobility, survivability, construction, terrain analysis and security engineering. The engineer possesses unique skills to visualize the battlefield and to plan, execute, and direct engineer missions, such as combat engineering or construction. The engineer has been specifically trained to perform the engineer role in the military decision making process, perform terrain analysis, and manage large construction projects (FM 5-100 1996, 1-9).

Based on the Army definition of leadership of "influencing people . . . by providing purpose, direction, and motivation . . . while operating to accomplish the mission and improving the organization," (FM 22-100 1999, 1-4) leadership can take place in any organization or group, not limited to combat or hierarchical organizations like the military. In the book *Transforming Leadership: From Vision to Results*, author John D. Adams identifies one of the challenges of leadership: "to see a leader-follower equation at the center is a must. To our detriment, we still see a leader as one person, sitting at the top of hierarchy, determining, for a group of loyal followers, the direction, pace, and outcome of everyone's effort. Passive followership, although perhaps a

traditional perspective, is neither functional nor preordained for today's probabilistic world" (1986, 12). Adams advocates more inclusion of the led: "We can 'see' the emergence of a new way of operating and describing reality while education, socialization, and culture limit us to the 'old' ways of thinking and describing what lies ahead" (1986, 16).

Summary

The literature review suggests there are many sources but no clear-cut answer to the thesis question. However, it is clear that to make the Army leadership development system work, mentors must take an active role to develop subordinates. Mentorship is the catalyst that causes the effective interaction of the three developmental action areas around the individual officer, providing opportunities for leaders to improve their skills, knowledge and behaviors.

The challenge is that "change is a leader-centric process" (Caldera 1999, 3). Once institutional training lays the basis for officer development, the leader must ensure that the officer receives greater breadth of their branch through operational assignment and self-development. The leader/mentor provides the opportunities for additional institutional training and focus for independent study. The health of the officer corps relies on proactive leader/mentors developing officers not only for their current assignment, but for several positions that lay ahead.

CHAPTER 3

RESEARCH METHODOLOGY

To answer the research question, it is necessary to assess the leadership environment and compare the engineer and leader attributes required at the midgrade level to those emphasized in the Army's leader development system. The subjects for this study were United States Army engineer officers at Fort Leavenworth, Kansas and current and former SF Group engineers (located at Fort Bragg, North Carolina; Fort Carson, Colorado; Fort Lewis, Washington, and Fort Campbell, Kentucky). Confirmation of the data was completed by conducting interviews with three leaders in molding engineering leadership into the Objective Force: Lieutenant Colonels Jeff Bedey, Harold Waugh, and Steve Reise.

Subjects

The data contained in this research are of two kinds, primary and secondary data. The primary data are the responses to the survey (appendix A) by engineer majors and lieutenant colonels and their demographic data. It is the primary data collected by the researcher that provided the greatest insight into current and future developmental issues. All participants were given the same briefing before taking the survey. This data was collected from CGSC students, faculty, engineer officers on Fort Leavenworth, and SF Group Engineers. Additional information was gained through interviews three leaders in leadership transformation. All subjects participated voluntarily. Secondary data is the literature reviewed in chapter 2.

Engineer Majors

The first subset consisted of thirty U.S. Army engineer officers from both CGSC Class 02-03 and U.S. Army Special Forces Groups. Table 1 shows that these officers have between eleven and fourteen years of commissioned service. Table 2 shows the subjects have primarily served in tactical positions (average eight years). The data does not support gender distribution because only three respondents were female. Therefore factors contributing to the generalization of this study to U.S. Army engineer majors are limited at best. Another factor limiting generalizations is years of commissioned service due to using both majors and lieutenant colonels.

A subset of the engineer majors consisted of four current and former U.S. Army SF Group engineers. This small pool was selected for inclusion because of the unique engineer branch qualifying position they fulfill. This niche position provides the officer the opportunity to work as the SF Group compound 'director of public works,' military construction point-of-contact with the local District Engineer, and the commander's engineer tactical advisor. Current trends have placed officers not selected for resident CGSC into the SF Group engineer position. While branch qualifying, it is not a traditional, well-understood position. As expected, the SF Group engineers have the same time of service as their resident CGSC counterparts. What is surprising is that only one SF engineers (fulfilling a more technical role) indicated a significant technical history prior to assignment in a group. The SF Group engineer position as branch qualifying is relatively new and the small population may not provide good statistical analysis.

Table 1. Years Of Commissioned Service

	<12 yrs	12-13 yrs	14-16 yrs	>16 yrs
O5				6
O4	4	21	5	

Table 2. Assignment History, Average Years

	Tactical	Technical	Other
O5	10	6	6
O4	8	4	3

Table 3. Highest Military Education

	CAS3	Non Resident GSC	Resident CGSC	Army War College
O5		2	3	1
O4	1	3	26	

Table 4. Civilian Education

	Technical Degree			Arts/Other	FE (EIT)	PE
	BS	MS	PhD			
O5	1	4	1	0	1	0
O4	2	23	0	5	12	2

Lieutenant Colonels

The second subset of subjects consisted of six U.S. Army engineer officers in the grade of lieutenant colonel (O5) stationed at Fort Leavenworth, Kansas. Many of these officers attended resident CGSC (67 percent) and one was selected for the Army War College. As expected, and in-line with Army promotion timelines, all of these officers have more than sixteen years of service. Table 2 indicated a similar proportionality to assignments in tactical and technical position as the major subgroup. This is contradictory to the assumption that, starting at the rank of major, engineer assignments become increasingly technical and less tactical. In accordance with Army promotion requirements, all of the lieutenant colonels had completed a senior staff school. One surprising statistic in table 4 was the low number of lieutenant colonels who pursued professional engineer licensure.

Instrumentation

The instrument used for this study is an author derived pilot survey. The survey (appendix A) consists of four parts: Part I, demographics; Part II, institutional training; Part III, self-development; and Part IV, operational assignment. The respondents were also invited to include any written comments at the end of the survey. The survey was approved through the CGSC Developments and Assessment Division and assigned a survey number (#03-013). Most of the questions ask the respondent to reply with a Liker Scale of 1=none, 2=little, 3=some, 4=much, 5=very much.

Procedures

The research procedures included survey administration approval, data collection, and analysis. To obtain approval to administer the survey, a sample survey was sent to

CGSC Developments and Assessment Division for approval. Time to develop a complete package from inception to approval took approximately six weeks. The approved survey is on file at the Developments and Assessment Division office.

Data collection was conducted via electronic mail. The researcher personally sent an electronic message with a Microsoft Word document survey attached to complete and return. It was estimated that the time to complete the survey was less than thirty minutes per person. Once the respondent completed the survey, it was saved, reattached to the reply electronic mail, and returned to the researcher.

To analyze the data, it was first manually entered into a Microsoft Excel spreadsheet, and analyzed for statistical significance. From the data analysis, demographic statistics, means and standards deviations and relationships for comparison were derived.

Limitations

Limitations of the study include the Hawthorne effect, self-perception, and pre-selection of the subjects. First, the subjects were asked to respond based on their jobs as field grade engineer majors, but intellectual reflection by officers on the Objective Force CGSC may be limited. Therefore, the experiment may have been biased toward increased reporting ratings in the same way that the Hawthorne effect supposedly results in increased self-perceived importance (Benson 1994, 57). Second, self-reporting may also be a source of bias due to subjectivity. This can sometimes be offset by observations from superiors, subordinates, or coworkers, but because the ratings were based on a specific job or period of time, such observations were not available. Third, the survey subjects were specifically selected due to availability. To compound the issue, only 56 percent of

majors and 38 percent of lieutenant colonels responded to the survey. Of the respondent pool only three were female, limiting the ability to measure the gender demographic perceptions. Finally, although the subjects were representative of the U.S. Army engineers, attendance at CGSC is limited to the upper 50 percent of each year group, and the SF Group engineers are a very small pool to draw conclusions from. Therefore, the leadership development perceptions of these groups may differ in ways beyond the ability of this study to detect. The survey was a good tool. Further use of the survey may provide better representation of the target audience.

Summary

The objective to determine how to develop and utilize engineer majors for the Objective Force is limited, but attainable. The researcher will utilize raw survey data, personal interviews, and literature to develop conclusions to the secondary questions. These three resource areas will provide a detailed look at branch qualification requirements and the three leadership development pillars in relation to current and future engineer battlefield functions. The first area to examine is the branch qualification standard for engineer majors under the Objective Force. The next task is to look at the current and future institutional training requirements as USAES transitions OES into the Objective Force structure requirements. Third, this thesis will determine the importance of self-development and mentorship for the future. Finally, it will be necessary to layout how operational assignments and emphasis on branch qualification positions could change fifteen to twenty-five years from now.

CHAPTER 4

ANALYSIS

Analysis of data was drawn from several sources: a pilot research survey, personal interviews, and literature. The pilot survey was sent electronically to United States Army engineer officers in the grade of major and lieutenant colonel at Fort Leavenworth, Kansas and current and former U.S. Army Special Forces Group engineers (located at Fort Bragg, North Carolina; Fort Carson, Colorado; Fort Lewis, Washington, and Fort Campbell, Kentucky). It is necessary to assess the leadership environment and compare the engineer and leader attributes required at the midgrade level to those emphasized in the Army's leader development system.

To help confirm the data, several interviews were conducted with three leaders in molding engineering leadership into the Objective Force: LTC Jeff Bedey, LTC Harold Waugh, and LTC Steve Riese. Lieutenant Colonel Bedey is the Director, Department of Instruction at the U.S. Army Engineer School at Fort Leonard Wood, Missouri; LTC Waugh is the Director of Installation Support at Fort Leavenworth, Kansas; and Lieutenant Colonel Riese is a Project Officer for the TRADOC Analysis Center at Fort Leavenworth, presently working on the Objective Force force structure.

Finally, the literature provides many sources but no clear-cut answer to the thesis question. However, the literature does indicate that leaders must provide the mentorship to develop well-rounded leaders for the future. One theme that rings true in both military and civilian leadership literature is the six imperatives providing leaders and individuals with a common base for evaluation and mentorship.

These six principles form a frame of reference for the individual officer, commander, and branch proponent to form a doctrinal base for instruction, a reference for self-development and operational performance (DA PAM 600-3 1998, 4).

First, provide a doctrinal basis for the Army, and therefore leader development to learn and apply the doctrine. Each officer must understand the constitutional and legal basis for having a standing army, national security objectives, Army ethics and values, and the different levels of warfare.

Second, leader development must be responsive to an ever-changing environment. American strategy is continually evolving to maintain friendly relationships with allies and coalition partners to meet an ever-changing world situation. Leader development must remain flexible enough to keep up with changes such as law, policy, resources, force structure, world situation, and technology.

Third, success should be measured by a leader's contribution to the Army. It is the individual officer's contribution as a professional in a profession of arms that is directly related to one's measure of success.

Fourth, high-quality soldiers deserve high-quality leaders. By human nature, the led will strive to meet and exceed the example set by their leaders, and in turn, earn the leader's admiration and pride. This internal competition is paramount to establishing esprit de corp within units.

Fifth, leaders can be developed. The other five principles are founded on developing leaders. Without this belief, the officer development system would cease to exist.

Sixth, the officer (self-development), the commander (mentorship and operational assignment) and the schoolhouse (institutional training) equally share the responsibility for developing leaders at every level.

It is a cooperative effort from the three pillars that develops effective leaders. It now clearer why the three pillars must mutually support each other. It is a concerted effort that effectively develops tomorrow's leaders to meet the six outlined principles.

Demographic Survey Data

The survey (appendix A) was sent out twice, on 13 December 2002 and 15 January 2003, to forty-seven engineer majors attending CGSC, seven SF Group engineer majors, and sixteen engineer lieutenant colonels working at Fort Leavenworth. Of the sixty surveys released, only thirty-six were returned (60 percent) for inclusion in this thesis. Of the thirty-six respondents, thirty (83 percent) engineer officers were in the grade of major (twenty-six were CGSC resident students, four were SF Group engineers), and six (17 percent) were engineer officers in the grade of lieutenant colonels (see table 7). Thirty-three (92 percent) were male and three female (8 percent) (table 8); thirty-five (97 percent) were active duty and one (3 percent) was Army National Guard (table 9).

Population year-group distribution ranged from 1981 to 1992, with 58 percent from year groups 90 and 91. Years of active federal service coincided with the year group distribution, with slight variations from prior enlisted service: 11 percent had ten to eleven; 58 percent had twelve to thirteen years; 14 percent had fourteen to eighteen years; and 17 percent had nineteen to twenty-two years (see table 10).

Respondents provided a wide range of military education experience. Completion of the Combined Arms Service and Staff School (CAS3) is required for promotion to

major and completion of the Command and General Staff College (CGSC) for promotion to lieutenant colonel. Only one major reported not completing the CGSC. Two lieutenant colonels completed the non-resident CGSC, three completed the resident CGSC, and one was selected for the Army War College (see table 11).

Civilian education experience coincided with expectations. All lieutenant colonels reported having a technical degree, with 83 percent reporting a master of science or doctorate degree. Officers in the grade of majors reported 83 percent possessing a technical degree, and 76 percent obtaining a master's of science degree. Surprising was only twelve of thirty-six respondents (33 percent) have taken and passed the fundamentals of engineering examination, and only two of thirty-six (6 percent) are registered professional engineers (see table 4).

Average assignment distribution did not vary between lieutenant colonels and majors. The average number of years in tactical assignments for lieutenant colonels was ten; technical assignments were six (only two of the six lieutenant colonels reported having technically oriented assignments); and six years in other assignments (mostly TRADOC or Military District Washington). Majors reported averaging eight years in tactical assignments; four years in technical assignments (only 12 of 30 reported having technical assignments); and three years in other assignments (mostly TRADOC or Military District Washington) (see table 2).

The demographic data suggests that an officer does not need professional engineering registration for a successful career. Again, the main reason most officers pursue a civilian master's degree is to enhance promotion potential to lieutenant colonel (master's degree not required until promotion to colonel). The Army climate is to develop

a large pool of officers in each branch for battalion command selection. In step with the climate, the respondents' opinions lean to maximizing assignments, training, and development opportunities that provide the greatest potential for success (promotion to lieutenant colonel and battalion command selection).

Branch Qualification

Department of the Army Pamphlet 600-3 outlines the individual, branch requirements for officer branch qualification. It is the Army's goal for majors to spend three years on station and receive twenty-four months in a branch qualifying position. For consideration for promotion to lieutenant colonel, engineer officers in the grade of major are required to complete Command and Staff College schooling and serve a minimum of twelve months in a qualifying operational assignment: battalion, brigade, or group XO or S3; assistant division engineer; cavalry regimental engineer; DDE in a USACE district; or DPW (1998, 86). Additional positions not listed but approved by the Engineer Branch include SF Group engineer and Ranger Regimental engineer.

The battalion S3 and XO positions are normally considered the traditional branch qualification assignments. An officer successfully completing twenty-four months as a S3 and XO will be highly competitive for battalion command. When asked how well institutional training prepared them for branch qualifying positions, 63 percent felt the institution prepared them very well for battalion S3 or XO positions. None of the respondents felt the institution prepared them (as well as S3 or XO) for any other branch qualifying position (SF Group Engineer, DPW, and DDE).

With the planned number of Stryker Brigades, Units of Action, and Units of Employment by 2015, the number of engineer battalions will significantly decrease (OF

White Paper, 2002, ii). This will leave the next generation of company grade officers seeking nontraditional, field grade, branch qualification positions to remain competitive for lieutenant colonel in 2015. It also begs to question if only those officers chosen to serve as battalion S3 or XO will be eligible to compete for battalion command. The future of engineer branch qualification may be foggy, but poses significant questions for branch specialization, career track, and assignment choices.

Compounding the lack of future engineer branch qualification positions, for officers in the grade of major, is that the UA may not have an engineer staff officer. Under the current design, the UA only has nine engineers assigned to the cavalry troop. Although the situation may change as the UA design continues to evolve (Riese, 2003). The UE is similar to corps headquarters design, but can function like a division or corps headquarters. Mission requirements will dictate the exact composition and make-up for different missions. The engineer unit contribution for the UE is not clear. Tentatively, the UE will have an engineer regimental headquarters, one corps combat engineer battalion, and a bridging company (Bedey, 2003).

Branch Specialization

Specialization within the engineer branch has been a consideration for many years. Should officers' careers track either combat, construction, or USACE? Respondents indicated a strong opinion supporting specialization: 78 percent support combat engineering, 50 percent support Public Works, 61 percent support topography, 67 percent support construction specialization (see table 13). While the respondents openly support officer specialization into many areas, the engineer contribution at divisional level and above is an engineer jack-of-all-trades. The maneuver commander expects any

officer wearing the castle (engineer branch insignia) to be equally capable to emplace a minefield, build a bridge, or construct a base camp. It enhances the need for effective mentorship, so officers understand their role in the Army structure as a field grade officer. Lieutenant Colonel Bedey stated that USAES plans to support broad branch experience and not subdividing the engineer branch into specializations (Bedey interview, 2003).

Well-rounded Engineer

Due to the diversity of the Engineer Corps, it is important to work equally well within all five engineer functional areas: mobility, countermobility, survivability, general engineering, and topography. Again, maneuver commanders expect anyone wearing the castle (especially field grade engineers) to provide support across the entire engineer functional spectrum. When respondents were asked if they thought they were well-rounded engineers, only 36 percent felt they fit the criteria, 39 percent felt they were somewhat well rounded, and 25 percent were not (see table 22). Many remarked they were well rounded within combat and troop construction assignments, but lacked experience in facilities and military construction. Contrastingly, when asked the importance of being well rounded, 53 percent felt well-roundedness was very important, with only 17 percent feeling it had little importance in one's career (see table 23). In line with battalion command preparation, many engineers (78 percent) feel that their assignment history has adequately prepared them for future tactical assignments, compared to only 39 percent prepared for technical ones (see table 24).

It is surprising that respondents support branch specialization (see table 13), but still feel that having a well-rounded career is important (see table 23). Respondents may

desire specialization within the branch, but *understand* that branch professionalism includes supporting maneuver commanders with the all of the branch capabilities.

Future Assignments

Respondents were asked their opinion on which position best prepares an engineer major for future assignments within the legacy force: SF Group Engineer, battalion S3 and XO, or DPW/USACE. From table 5, ranked branch qualifying assignment preferences within the current force structure, the clear order of precedence is battalion S3 and XO, DPW or USASCE, and SF Group Engineer. All officers are mentored throughout their career that successful assignments as battalion S3 and XO brings a greater expectation for battalion command.

Table 5. Best Legacy Force Engineer Assignments

	None	Little	Some	Much	Very Much
SF Group Engineer	3	24	53	18	3
Battalion S3 or XO	0	0	3	33	64
Public Works or USACE	6	6	30	55	3

Table 6 shows that opinions change slightly when asked about which position provides the greatest development for future assignments under the Objective Force. Battalion S3 and XO is still considered the premier assignment to prepare for the future. Although 78 percent reported having received a briefing or knowledge of the Objective Force, many engineers may not understand the force structure impact on the future number of battalions. Legacy opinions for the SF Group engineer assignment do not change under the Objective Force, but move up in the ranking. Lastly, DPW/USASCE

positions fall slightly under the Objective Force, showing respondents believe that non-troop assignments carry less weight with promotion boards.

Table 6. Best Objective Force Engineer Assignments

	None	Little	Some	Much	Very Much
SF Group Engineer	0	21	53	21	6
Battalion S3 or XO	0	0	15	39	45
Public Works or USACE	15	24	33	27	0

Engineer Fuctionality and the Maneuver Commander

Engineers perform five primary functions in the theater of operations: mobility, countermobility, survivability, general engineering, and topographic engineering. As the Army transforms, engineers will be faced with great challenges to ensure they are fully integrated into the maneuver plan. Full integration means engineer command and control can respond rapidly on a dynamic battlefield to support the maneuver's task and purpose. For greater depth of analysis the five basic engineer functions were expanded to mobility, countermobility, and survivability (M/CM/S), facilities engineering, construction, training validation, demolitions and explosives, geospatial analysis, security engineering, base camp construction, humanitarian demining operations, and engineer command and control. The legacy force and objective force opinions were analytically compared to discover significant differences under institutional training and operational assignments.

Institutional training includes all of the schoolhouse training and education leaders receive. While learning to perform critical leader tasks, leaders also integrate values, attributes, skills and actions to develop high-quality leadership capabilities.

Institutional training provides the starting point where all future development begins (DA PAM 600-3 1998, 3).

Operational assignments provide the opportunity to broaden the knowledge base and refine skills gained during institutional training and previous assignments. Varied and challenging assignments prepare leaders for positions of greater responsibility both in garrison and in the field. The commander or unit leader significantly influences the subordinate's development, by setting goals, maintaining standards, and providing continual feedback (DA PAM 600-3 1998, 3).

Mobility, Countermobility, Survivability

Mobility, countermobility, survivability are the foundation blocks for combat engineering. Currently, maneuver commanders depend greatly on engineers to gain and maintain freedom of movement on the battlefield (FM 5-100 1996, 1-9). The respondents' opinions clearly show that M/CM/S functions will continue being a major contribution within the Objective Force. With the Objective Force's clearly stated goal of "assured mobility" (OF White Paper 2002, 6), it is not surprising that the levels of importance did not differ greatly between the legacy and objective force opinions in both the institutional arena and operational assignment.

Survey opinions for M/CM/S were very high. Within the institutional training question the respondents felt that M/CM/S would continue to dominate engineering institutional training (Legacy: 91 percent high to very high, OF: 74 percent high to very high; see table 12a). For operational assignments, respondent maintained a high opinion for M/CM/S in both the legacy and objective forces (86 percent and 85 percent, respectively; see table 19a). Likewise, respondents felt M/CM/S had high to very high

importance to the maneuver commander (legacy: 97 percent, OF: 79 percent; see table 21f).

Facilities Engineering

Facilities are necessary to support military operations. Engineers provide the unique skill to maintain the installations and facilities necessary to support military operations. Usually engineer officers are not exposed to facilities engineering until they reach field grade status. Also, troop units do not normally deal with facilities engineering That job is left to the director of public works, engineer district, or echelons above corps engineers.

Special Forces units require engineer technical and tactical support. Unlike conventional forces brigade-level (and below) engineers, the SF Group engineer performs an additional function as the SF Group commander's facilities engineer. Reasons for the SF Groups requiring their own facilities engineer include special operations funding source, installation tenant activity, and organizational structure.

Survey respondents felt that facilities engineering had little importance institutionally or operationally, now or in the future. More than 70 percent of the respondents felt facilities engineering had little or no importance within the legacy force institutional training arena. Likewise, 58 percent felt facilities engineering had little or no importance for developing officers in the Objective Force see table 12b). Most respondents felt that public works and facilities had little importance to the maneuver commander (Legacy: 53 percent, OF: 63 percent; see table 21e). Under operational assignment, opinions were equally low. Sixty-two percent felt facilities engineering had little or no importance within their assignment history; and 59 percent felt facilities

engineering would have little to no importance on assignments within the Objective Force (see table 19b).

Many respondents were concerned that DPW or USACE (facilities engineering) jobs are second-class to troop related assignments. Most expressed opinions that facility construction and support is virtually invisible to the maneuver commander. Most commanders do not manage their facilities, as it is an installation function. Overall perception is maneuver experience and troop assignments make a greater impact on promotion boards; and it is the maneuver commanders that sit on the promotion boards.

One opinion countering the low facilities engineering opinions is the UA engineer may be required to monitor and maintain UA's facilities. As currently designed, the UA is an independent brigade-size unit. During peacetime, the UA may not have a parent unit to establish and maintain its facilities. One function of the UA staff engineer will be much like the SF Group engineer today, facilities management. "In addition to all the tactical training, the [SF] Group and [Ranger] Regimental Engineer get ample practice in civil engineering tasks as well . . . Often, far and above those which his peers are given [branch qualification] credit as Deputy District Engineers. The [SF] Group and [Ranger] Regimental Engineers are intimately involved with the facilities management and repair aspect similar to that of the directorate of public works. [They] must submit and keep tabs on the entire group's work orders. Similarly, the [SF] Group and [Ranger] Regimental Engineer is instrumental in the installation's submittal of the Installation Status Report to Department of the Army. The Group and Regimental Engineer is also the designer, originator and project manager of all [operations and maintenance] construction projects within the Group. When applicable, the Group and Regimental Engineer is also

intimately involved with the Military Construction projects and the submittal of the Department of Defense Form 1391. In this case as well, the Group and Regimental Engineer acts as the Project Manager and is an integral part of the Quality Assurance and Quality Control team" (Tkacs, 2000).

Construction

Engineers are historically connected to construction. In every major war the engineers have been known for their unique ability to build bridges, roads, and buildings. Today, engineers build forward log bases, heliports, and main supply routes to meet the Engineer Corps' operational construction requirements. Due to the fluidity of the Corps' mission, construction is normally limited to support near-term operations. Long-term construction normally falls on the USACE. In the Balkans, the U.S. Army may have diminished the battlefield contribution of soldier-led-construction, by having USACE contract civilian construction companies to build and maintain base camps and log bases.

On the survey, 59 percent of the respondents felt the institution only met 'some' of their needs to adequately conduct construction during their assignments. Respondents also felt that institutional construction training needs greater emphasis in the future, as 67 percent reported 'some' to 'much' importance (see table 12c). Under operational assignments, 53 percent of the respondents opined that construction had a high level of importance within the legacy force. Opinions were significantly lower within the Objective Force, where only 38 percent felt construction would only have a high level of importance (see table 19c). Although respondents felt construction had operational assignment importance, they felt construction had little to no importance to the maneuver commander (Legacy: 49 percent, OF: 54 percent; see table 21b). These numbers run

contradictory to field requirements as maneuver commanders still require construction support for assured mobility and troop morale (roads and trails, bridges, base camps, showers, privies, and landing zones).

Engineer officers want to continue performing construction tasks, but the Army is trying to reduce the deployed footprint. Other factors such as cost, time, and trade-certification lead the Army to choose host-nation support or U.S. contractors. If the Army continues to hire host-nation or U.S. civilian contractors to perform construction, there may not be a need to continue training or maintaining combat heavy (construction) units. It is very expensive to move a combat heavy battalion into a theater and they have little combat capability.

One area developed by the Air Force and Navy is to train soldiers to journeyman trade standards. SEABEES and Airmen are able to perform construction tasks at the same level as their civilian counterpart. Officers are encouraged to earn professional registration, embodying “high quality soldiers deserve high quality leaders” (DA PAM 600-3 1998, 4). On the other hand, the USAES encourages officers to establish professional engineer registration, but it offers few opportunities for utilization. Furthermore, professional registration does not directly impact assignments or promotion. Army soldiers trained in construction also do not earn journeyman status within their military occupational specialty. Upon leaving the service they have many hours of experience, but no certification to back it up. The Army could make great strides for both officer and enlisted engineers by incorporating professional requirements recognized by civilian industry.

Training Validation

Training assessment and validation is ultimately the commander's responsibility (FM 3.0 2002, 6-1). As an organization, the Army is very parochial and at times highly specialized. Units training technical tasks (outside their assigned branch) for use on the battlefield need training validation from a recognized expert. Just as commanders are responsible to train their units, the staff engineer is responsible to ensure the supported unit is training with, and able to complete the up-to-date M/CM/S techniques and standards. Whenever possible, the engineer should validate engineer peculiar tasks by providing the maneuver commander with objective training observations.

On the survey, 53 percent of the respondents felt current institutional training did not prepare them to properly perform training validation. Sixty-one percent felt that institutional training needed to place greater emphasis on training validation techniques in the Objective Force curriculum (see table 12d). Responses to training validation within operational assignments, 53 percent of the respondents felt training validation held great importance within the legacy force. Likewise, 50 percent felt that training validation would continue to be an important leader task (see table 19d). The question did not specify training validation of engineer units, supported units, or both.

Respondents displayed significant concern that they are not adequately prepared to validate unit training. As the Army engages in full spectrum operations, training validation will have even greater importance in the future, as soldiers will be asked to perform a greater array of tasks to successfully complete missions. This is an area institutional training should consider placing greater emphasis in the future

Demolitions and Explosives Training

Demolitions and explosives training is another foundation of combat engineering. It is primarily used for breaching operations, but also to maintain mobility, counter the enemy's mobility operations, humanitarian demining, and some construction missions. "The . . . [e]ngineer is at the forefront of all breaching operations. Whereas [maneuver units can be] very proficient in breaching techniques, often demolition charges placed with the best intentions can lead to disastrous results, [when] not placed correctly. Here again is where the . . . [e]ngineer becomes intimately involved with breach training and operations. The [e]ngineer has the necessary architectural and construction background to teach and advise the correct placement of explosives that will yield maximum desired effect [versus] bring[ing] down the entire building if a critical structural support member fails in the building being breached. The mechanics involved with breaching can also create dangerous over-pressure situations in rooms where perhaps there are noncombatants being rescued" (Tkacs, 2000).

In the survey, 55 percent of the respondents felt the institution prepared them to conduct demolitions and explosive training and missions. Likewise, 50 percent felt the institution should maintain demolitions and explosives training within the Objective Force (see table 12e). Respondents' operational assignment opinions did not vary greatly from the institutional comparison: 50 percent percent felt demolitions and explosives training had great important; and 44 percent felt demolitions and explosives training within the Objective Force will be equally important in the future (see table 19e). Importance of demolitions support to the maneuver commander was lower as 40 percent

of the respondents felt it only had ‘some’ importance in the legacy force, and 42 percent reported ‘some’ importance in the Objective Force (see table 21g).

Geospatial Analysis

Engineers are the Army’s terrain experts. They provide the maneuver commander with an engineer analysis of the terrain, focusing on trafficability, and identification of likely enemy obstacle locations. A proper terrain analysis provides friendly mobility corridors in the offense and enemy axis of advance in the defense. Legacy computer programs, like Terrabase, and similar Objective Force computer programs like the digital terrain support system (DTSS) in the Maneuver Control System, analyze terrain data to produce graphics overlays containing mobility conditions, lines of sight, and weapons range fans. The engineer’s terrain analysis is indispensable to the maneuver commander.

Sixty-eight percent of the respondents felt the institution did not provide adequate geospatial analysis training. Likewise, 78 percent of the respondents felt geospatial analysis is a very important subject to cover thoroughly, now and into the future (see table 12f). Respondents’ opinions clearly indicate they do not feel they received adequate institutional geospatial training, and the institution should increase its importance in the future. Although only 25 percent felt geospatial analysis was significant within their assignment history, 44 percent felt geospatial analysis would continue gaining greater significance as the Army continues digitizing legacy systems and developing the future combat system (see table 19f). To highlight this point further, 71 percent of the respondents felt that geospatial analysis was very significant to the legacy force maneuver commander, and 76 percent felt that it was very important for maneuver commanders in the Objective Force (see table 21a).

Security Engineering

Security engineering for military construction has been around for many years. The *Department of Defense Antiterrorism Standards for Buildings* assigns responsibilities, and prescribes procedures for incorporating antiterrorism and force protection measures into military construction. Security has taken on a greater significance since the terrorist attacks on Kobar Towers in Saudi Arabia, and more recently the World Trade Center in New York City. During the planning and development of military facilities, the installation staff incorporates these measures into the construction plan. With a basic understanding, security engineering practices can be extrapolated and applied to field craft: support and stability operations, distribution points, rear area operations, and base camp security (2002, 7-8).

In the survey, 67 percent of the respondents felt they received little or no institutional training on security engineering, and 78 percent felt it had 'some' to 'very high' institutional importance in Objective Force instruction (see table 12g). Similarly, 64 percent of the respondents felt that security engineering had little or no impact within their assignment history, and only 27 percent felt it could have greater importance in Objective Force engineering assignments (see table 19g). Respondents felt security engineering had little importance to the maneuver commander with 64 percent indicating little to some importance in the legacy force, and 63 percent in the Objective Force (see table 21c). The low opinion could reflect on the respondents' limited knowledge of security engineering, lack of training opportunities, or the civilianization of facilities management.

New emphasis has been placed on the engineer's advice to the maneuver commander on security engineering. With terrorism and asymmetric warfare as a priority threat to our democracy, it is important to protect our soldiers at home and abroad. Security engineering will remain important, as future forces will conduct full spectrum operations in contiguous, noncontiguous, linear and non-linear battlefield conditions, possibly within the same area of operations.

Base Camp Construction

The Army often deploys forces to underdeveloped areas of the world. Soldiers and support functions need a base to operate from. Proper base camp construction and maintenance is vital to the health and strength of the force. Careful engineer planning is necessary to ensure proper location of administrative, sleep, mess and maintenance areas. Power, water, and sewer distribution ensure the force can sustain for the duration of the operation.

Many respondents (62 percent) felt they did not receive enough institutional training on base camp construction and maintenance under the legacy force system, and 74 percent felt base camp construction should have higher importance in the Objective Force institutional training plan (see table 12h). Fifty percent of the respondents felt that base camp construction had little impact on their assignments history, but 80 percent felt base camp construction will have 'some' to 'much' importance in Objective Force engineer assignments (see table 19h).

Most engineers are not exposed to temporary or permanent basecamp construction. Most deploying units do so into developed areas. Even the units in Bosnia and Kosovo lived in basecamps built and maintained by a U.S. contractor. The Army is

more willing to use host nation and contractors to support troops versus troop construction units to minimize cost and rear area build up. The only area of the world where base camps are constructed and maintained by troops is in Afghanistan, where with their engineer playing a major role, SF units are establishing bases and safe houses for troops and equipment in remote parts of the country.

Humanitarian Demining Operations

Due to congressional Title X requirements, the U.S. State Department and the U.S. Army has given most humanitarian demining operations to U.S. Army SF units and civilian contractors. In addition, U.S. Army SF units have had great success training indigenous units to demine their own countries. If SF's current OPTEMPO continues, the State Department (with congressional oversight and possible Title X changes) may be forced to use conventional engineer units to train recovering, war-torn nations to eliminate unexploded ordinance. Humanitarian demining techniques not only apply to the existing landmine situation, but also to future battlefield cleanup of unexploded ordinance and minefield elimination.

Opinions from the survey indicate officers received none to little institutional training on demining operations (80 percent). A strong 61 percent expressed demining could have greater institutional training importance within the Objective Force curriculum (see table 12i). Operationally though, 70 percent of the respondents felt that demining operations had little or no impact in their assignment history. Conversely, 59 percent feel demining operations will have a greater importance in the Objective Force (see table 19i).

Engineering Command and Control

Engineer command and control (C2) must function rapidly to meet the maneuver commander's requirements. The five primary engineer missions to engineer C2 are mobility, countermobility, survivability, general engineering, and topographic engineering. To maintain relevance to the maneuver commander, engineers must masterfully weave each function into every facet of the maneuver plan. Increased knowledge leads to increased flexibility to meet unforeseen challenges.

Sixty-one percent felt they received an adequate knowledge base to command and control engineer assets on the battlefield, and 74 percent felt engineer C2 would be highly important within the Objective Force training regime (see table 12j). When asked about engineer C2 impact on assignment history, 67 percent responded that engineer C2 played a significant role on a regular basis. Likewise, 82 percent felt engineer C2 would continue having a significant role within the Objective Force structure (see table 19j).

Engineer C2 encompasses the total engineer leader contribution and respondents' opinions display an overall maneuver contribution opinion. As field grade officers, it is their responsibility to command and control engineer assets on the battlefield. Formal engineer training ended with the CCC. But as field grade officers, they are expected to integrate all battlefield operating system (including engineering), forming an effective maneuver plan.

To better meet future engineer C2 requirements and address the Army's transformation, LTC Kevin Lindsay recommends several improvements. First the engineer C2 structure should mirror the maneuver units. Within its own organization, the current engineer C2 differs between heavy and light divisions with light being one rank

lower. Secondly, he recommends discontinuing either engineer groups or brigades. Currently either engineer groups or brigades support corps. Eliminating one will reduce the duplication, streamlining the overall C2, and providing a lower requirement for digitization. Finally, design a common corps engineer battalion. Corps engineer battalions should have the capability to equally conduct combat or construction operations. Combat heavy (troop construction) engineer battalions have little combat capability and are usually utilized in the corps rear area. Conversely, corps combat battalions do not have the equipment to maintain main supply routes. Greater support could be provided to the corps or UE by designing a multifunctional combat/construction battalion. Based on the mission assessment, the necessary combat, construction, and bridge companies could be deployed.

Self-Development

Self-development not only helps to integrate institutional knowledge into operational assignments, it also helps to develop readiness for positions of increased responsibility. The difficulty of self-development is self-awareness and determination of areas that need improvement. Without mentorship and guidance many officers are unable to objectively determine professional and personal weaknesses and implement improvements.

Respondents were asked about individual self-development habits to include professional books, professional development time, and mentorship. They indicated reading an average of four history, two science, four Army doctrine, and two joint doctrine books within the last two years (see table 15a). Respondents also reported devoting an average of 14 hours per month to self-development (see table 16). A

surprising, and significant statistic is 64 percent reported not having a rater, senior rater or mentor supervise their self-development program (see table 17). It raises questions if the reported reading and professional development time is properly directed to maximize the individual's professional development needs.

Finally, the respondents were asked to rate the importance of self-development in the Objective Force for the different engineer functions: 84 percent felt future engineer officers would spend a majority of their self-development time on terrain visualization skills; 68 percent felt that construction would require some self-study; 39 percent would devote much of their self-development time to security engineering; 61 percent felt self-development on M/CM/S would be very important, demolitions and explosive would have some importance, and facilities would have some to little importance (see table 18). It is surprising that the respondents felt M/CM/S would require significant self-study to maintain skills and also feeling that the institution provided adequately in the same area. Overall, the indication is that it is the individual's responsibility to maintain skill sets to support their duties, especially in those areas not used regularly, such as terrain visualization, and security engineering.

The most significant self-development figure is that 64 percent of the respondents do not have a mentor that reviews and guides their self-development program. Field Manual 22-100 states "self-development is a joint effort" involving the officer, rater, and senior rater. It is the commander's responsibility to set goals and monitor progress (1999, 5-15). Ultimately though, it is the individual officer's responsibility to follow the guidance and to *self* develop. Contrary to FM 22-100, all respondents reached the field

grade officer level, each with over 11 years experience, most (81 percent) selected for the resident CGSC course suggesting their individual developmental program is working.

Retired General Gordon R. Sullivan states that leader development is shared between the organization and the individual. The commonality is that the program is self-initiated, directed, and oriented toward some tangible developmental goal (Sullivan 1997, 215). Almost every reference states that self-development is a shared program and it is every leader's responsibility to develop subordinates. It is troubling that over 60 percent of the respondents reported not having a mentor or receiving self-development assistance. Many of the respondents believe they are self-developing effectively, but the focus of their programs without mentoring must be questioned. General Gordon states further, "By counseling, coaching, and mentoring, a leader helps guide a subordinate by providing feedback, suggesting goals, defining expectations . . ." providing structure (Sullivan 1997, 216).

Relevance for the Future

The Army as a whole faces both technical and social challenges. "The unique organization of the U.S. Army is founded on mission and [it] evolves based on need and resources available . . ." (McChrystal 1997, 3-1). The mutual support of institutional training, operational assignment, and self-development is more important now than ever. Mentorship is the glue that binds these three areas to build effective future leaders; primarily from superiors (rater and senior rater), but also from peers and, in some instances, subordinates.

Today, officers receive broad branch education at the schoolhouse, branch depth appreciation through assignments, and feel they need little self-development or

mentorship for success. Future decentralization of officer education will place more emphasis and greater expectations on the mentor/mentorship role. As the institution changes the method of instruction for depth versus breadth, varied operational assignments will provide the depth an officer requires to fully develop and support their branch. Much of introductory education and education maintenance will come through self-development, but mentorship will determine what and how much self-development is required for each individual officer.

The future success of OES will depend on commanders, as mentors, investing more time to develop their officers. Units will gain officers that have been trained for a narrower mission focus. It is the commander's responsibility to begin developing the officer for the broad range of engineer missions and functions. As mentor, the commander must juggle operational requirements against the individual's self-development needs. At times, the commander must be willing to sacrifice resources to develop officers for follow-on and future assignments versus the immediate needs of the unit. Commanders will no longer develop officers only for requirements under their command, but also to meet the individual's and the Army's long term plan.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

Introduction

The Army is committed to developing future leaders at every level. Through progressive, sequential, and continuous education, officers develop skills, values and attributes necessary for positions of increased responsibility. For too long, the Army has used a cookie cutter approach to developing senior grade officers. Unlike armor, infantry and field artillery, not every branch needs every officer prepared for command. Many engineer jobs are command equivalent, but oriented to public works and military construction.

The standard for leadership development is operational doctrine, which is evolving to meet the challenges of the future operational environment. A capability may be acquired by a change in doctrine, organization, training, leader development, materiel, or personnel, or facilities (DOTLM-PF). Doctrine must change to meet the needs of the Army. As a doctrinal basis for engineer leader development, USAES is changing the officer education system to reflect the individual, institutional and operational assignment needs.

To effect change, the target group is today's battalion and brigade commanders. They are in a position to provide the greatest level of mentorship to the greatest number of officers. The Army continually changes to meet the nation's strategic requirements, and leaders must lead change by being "able, through professional development and competence, to provide the required direction, persuasion, and instruction to senior, peers, and subordinates so that the requirements for and the acceptance of change is

understood to be the normal conditions, rather than the exception to the normal, in the accomplishment of assigned missions" (US Army War College 1997, 8-2). To meet this challenge the Army leader development model (institutional training, operational assignment, and self-development) must be augmented by greater leader mentorship to mold leaders for the future.

Conclusions

To prepare midgrade officers for organizational leadership requires leader development. The proposed transformation engineer OES will radically change how officers at any level are developed in the future. Instead of three distinct independent pillars, the new OES will weave institutional training, self-development, and operational assignments into a mutually supporting process that will benefit the Army and the individual officer.

Answering the Thesis Question

The primary question for this thesis was, "As the Army transitions to the Objective Force, how will the Army leadership development model develop midgrade engineer officers for future assignments?" To prepare midgrade engineer officers for organizational leadership requires leader development. The current system has some shortcomings. First, the three pillars of leader development have only recently been linked together. Indoctrinated officers will have to change their thought process to apply mutually supporting areas of leader development effectively. Secondly, an institution education 'hole' will exist for eight to ten years as younger engineer officers receive modular training. Officers who have completed the CCC will have to participate in Army Distance Learning (ADL) to maintain institutional currency within the branch. The future

education system will allow officers to utilize a combination of Army distance learning and immersive, experiential learning to gain required knowledge for upcoming assignments. Finally, command mentorship is necessary to ensure officers get the necessary assignment patterns to grow professionally across the entire breadth of the Corps of Engineers.

Secondary Questions

1. What institutional training changes are necessary for midgrade officers to be successful in the future? Institutional training and education will continue to train officers, but it will be more focused on their next immediate assignment. Additional training and retraining opportunities will exist in the proposed system, by allowing officers to access additional training modules through ADL.

The Captain's Career Course will integrate both Army distance learning and experiential training experience. Much of the immersive training experience will follow the training model at the Command and General Staff College to include small group learning environment and simulations and historical vignettes to reinforce course material. Officers will leave the CCC with the necessary knowledge depth to succeed at their next assignment.

The secondary impact of transformational OES is that as officers change assignments, they can receive additional training modules through reach-back, distance learning opportunities. "Our transformed education will be a blend of world class ADL (cognitive learning) and focused/immersive resident training (experiential learning). Believe we can achieve the technical/tactical competencies via ADL and will reach the plateau of confident/adaptive/agile leaders through the experiential learning experience

(Bedey email, 2003).” Engineer staff and technical assignments requiring specific training modules will be taught at the USAES. One particularly useful aspect of modular reach-back training is that officers will be able to refresh and update on current engineer staff and technical information. With institutional transformation two additional changes must accompany: role of commanders and the assignment process. Commanders must buy in to these educational changes. They must be willing to provide their subordinates with the time and opportunity to receive “assignment oriented just-in-time training” (Bedey email, 2003). As engineer branch depth training will be assignment oriented, PERSCOM will have to play a greater role in ensuring assignment diversity to add to the officer’s branch knowledge breadth.

2. Does the Army rely too heavily on the individual officer to self-develop in the leader development model? Clearly, yes. For many officers, the current self-development system does not work. More often than not, self-development for field grade officers is not monitored or mentored. As officers prepare individual development plans, they must interrelate with both the grade of the officer, civilian and military education requirements, and current and future operational assignments. Self-development will have an even greater importance in the future. Unlike institutional training, self-development is continuous throughout one’s career, and as the name implies, it is the responsibility of the individual officer.

One of the most difficult aspects of leadership is introspection. Each officer should have a mentor or advisor to help make good career choices. Over 60 percent of survey respondents claimed they do not have a mentor. As they spent an average of twelve hours per month on self-development, is this time wasted without proper direction

and guidance? Many times officers 'go to what they know' and do not seek positions outside their comfort zone. It is the rater, senior rater, commander, and or trusted mentor that acts as the honest broker; providing valuable insight to sustain strengths and improve weaknesses.

"Commanders [and] leaders will be the driving force behind the success of our education system. They must provide the time [and] opportunities for our young leaders. In an education system founded upon assignment oriented training, the diversity of assignments [and] jobs will be a big driver. Therefore, there will be a direct correlation between assignment patterns and the breadth of one's education" (Bedey interview, 2003). The link between assignments and education is the commander, leader, or mentor. Commanders (at the appropriate level) must play an active role to layout an officer's future; deciding what assignments and educational training is necessary, not only for the unit, but the individual's professional development.

Self-development will be the central focus of leadership development in the future. Officers will be required to learn the breadth of their branch through self-study and development. The institution and operational assignment will provide depth, but only in the assignment area.

3. What is the appropriate midgrade engineer operational assignment for future development? Today's operational environment is multi-dimensional, dispersed, continuous, and noncontiguous in nature. The enemy attacks asymmetrically; evolving and adaptive to our doctrine. Today's soldier is already evolving to meet Objective Force requirements: responsive, deployable, agile, versatile, lethal, survivable, and sustainable

across the full spectrum of military operations. Evermore today's organizational leaders must be prepared to operate in this diverse, ever-changing environment.

Battalion S3 and XO will continue to be the assignment of choice within the engineer branch. Throughout an officer's career it is well known that those chosen for battalion command normally serve a total of 24 months in those two jobs. In the past, officers actively 'worked-the-system' for these two coveted assignments and the process will continue in the future. The Objective Force will change the current engineer battalion structure as we currently know it. The UA will have at least an engineer staff officer, probably a major; and the UE will have an engineer resource pool that the UA can draw from as the mission requires.

The challenge will be the commander's commitment to developing soldiers for the future; a potentially large weakness in transforming the system. Interaction of officers, mentors, educational and assignment opportunities must be carefully combined on a case-by-case basis to meet the officer and unit's requirements. Commanders must be willing to take officers out of their comfort zone to gain greater breadth within the branch. Only through varied and diverse assignments will future officers develop the necessary combination of assignments to function effectively across the entire mission spectrum.

Recommendations

Mentorship--so what? More than two-thirds of today's officers claim they do not have a mentor. Many hours of self-development is not monitored or focused on current or future assignments. Many officers cannot function effectively within the five engineer functions to support maneuver commanders. The importance of mentorship cannot go

understated. Clearly, it is the commander/mentor's responsibility to focus their officers to develop a deeper understanding of their branch.

In the future OES, commanders must ensure officers serve in positions outside of their comfort zone. Today, few officers consider themselves 'well-rounded engineers.' Most male officers go to great lengths to remain within the combat engineer world, shunning construction and facilities engineering. Fewer yet are the female officers willing to break into the combat engineer arena. Even the current promotion system propagates tactically oriented engineer officers without consideration to successful, well-rounded assignments.

Every officer should have a mentor and be a mentor. Just as General Sullivan recommends "two up and two back" (Sullivan 1997, 125-6) for evaluating potential, officers should seek out mentors that are at least two grades above their own. Conversely, officers should look two levels back for junior officers that need direction and focus for their successful development. Why be a mentor? It is an investment in the future success of the Army and the nation.

Final Thoughts

Mentorship is more important now than ever. From the survey responses it is clear engineer officers are not receiving effective mentorship. Even today as the United States begins to help Iraq rebuild there are still tactical engineer officers telling maneuver commanders they do not have the breadth of experience to conduct construction missions. The factors contributing to this event is unfocused self-development, narrow assignment experience, and lack of effective mentorship to change both. Twenty-first

century commanders will have greater managerial responsibility to balance the needs of the Army against the needs of the unit and the individual.

Mentorship is where the rubber meets the road. It is the one ambiguous factor that makes the Army Leader Development Model work. The future OES depends on mentorship to bind together focused institutional training; past, present, and future assignment rewards and requirements; and self-development to maintain strengths and correct weaknesses. Many officers today do not know what a mentor can contribute to their career. But whether during institutional training, operational assignments, or self-development, active mentorship places officers on the right path to success. Self-evaluation is difficult alone. Even as we look at ourselves many times we cannot see how to correct our own faults. It is our duty as leaders to seek out superiors, peers, and subordinates to give us frank feedback on our capabilities to achieve excellence, and lead forces that can fight and win the nation's wars and serve the common defense of the United States.

APPENDIX A

MIDGRADE ENGINEER OFFICER DEVELOPMENT SURVEY

SURVEY INSTRUCTIONS

Thank you for taking your time and effort to take this survey. Please read the following instructions before taking the survey.

1. The survey you are about to take has been approved by the U.S. Army Command General Staff College (Survey Control # 03-103, CGSC-DAD, Dr Bitters).

2. Your experience as an officer and the accuracy of the data you provide is critical to the success of this study. Therefore, your careful completion of the survey is greatly appreciated.

3. All responses are private. Your name will not be connected with your responses or comments on this survey.

4. There is no time limit in taking this survey, but should take no more than 30 minutes to complete.

5. Only US Army engineer majors and lieutenant colonels should take this survey.

6. Note that the survey has three parts. Please ensure you answer the entire survey.

7. When you have completed the survey please email it to joseph.e.staton@us.army.mil or mail it to:

MAJ Joseph E. Staton
2608 Folsom
Leavenworth, KS 66048

8. If you have any questions please feel free to email me at the above address or call at (913) 682-6316.

SURVEY: Midgrade Engineer Officer Development

PART I. DEMOGRAPHIC INFORMATION In Part I, please mark the appropriate answer to each demographics category. If a particular demographic does not apply, please skip to the next question.

1. Rank: O3 O4 O5

2. Gender Male Female

3. Component: AD Reserve Guard

4. Year Group _____

5. Total Months on Active Federal Service: _____

6. Highest Military School Completed or Attending: CAS3 NRes CGSC Res CGSC AWC

7. Civilian Education: Bachelor Degree: Arts Science
Other:_____
Masters Degree: Arts Science MMAS
Other:_____
PhD: Arts Science
Other:_____

8. Months in the following assignments:

_____ Tactical (assignments with troops)
_____ Technical (assignments in Public Works, USACE, Echelon Above Corps, etc)
_____ Other (please indicate) _____

9. Have you completed and passed the functional engineering (FE) exam? Yes / No

10. Have you taken and passed the professional engineering (PE) exam? Yes / No

11. Have you received a briefing on the Objective Force, covering the Unit of Action, Unit of Employment and suggested composition? Yes / No

PART II. INSTITUTIONAL TRAINING

1. With respect to the legacy force, rate the following areas with respect to institutional training. (1=none, 2=little, 3=some, 4=much, 5=very much)

____ Mob, C-mob, Surv
____ Facilities Engineering
____ Construction
____ Training Validation
____ Demolitions and Explosives Tng
____ Geospacial Analysis
____ Security Engineering
____ Base Camp Construction
____ Humanitarian Demining Ops
____ Engineer C2

2. With respect to the Objective Force, rate the importance of the following areas with respect to institutional training. (1=none, 2=little, 3=some, 4=much, 5=very much)

____ Mob, C-mob, Surv
____ Facilities Engineering
____ Construction
____ Training Validation
____ Demolitions and Explosives Tng
____ Geospacial Analysis
____ Security Engineering
____ Base Camp Construction
____ Humanitarian Demining Ops
____ Engineer C2

3. Rate the importance of engineer officer specialization within the branch. (1=none, 2=little, 3=some, 4=much, 5=very much)

____ Combat Engineering
____ USACE and DPW
____ Topography
____ Combat Heavy / Construction
____ Special Operations

4. How well did institutional training prepare you to perform in the following positions? (1=none, 2=little, 3=some, 4=much, 5=very much) Mark only those you were assigned to.

____ SF Group Engineer
____ Engr Battalion S3 or XO,
____ Director of Public Works
____ Deputy District Engineer

PART III. SELF DEVELOPMENT

1. How many professionally related books have you read in the last 24 months that relate to your present or future assignment?

History _____ Army Doctrine _____
Science _____ Joint Doctrine _____

2. How many hours a month do you spend on professional self-development?
_____

3. Does your rater or senior rater mentor you and/or your self-development program (yes/no)?
4. With respect to the Objective Force, how important will self-development be in the following areas for midgrade engineer officers? (1=none, 2=seldom, 3=some, 4=frequently, 5=always)

____ Terrain Visualization
____ Construction
____ Security Engineering
____ Mobility, Countermobility, Survivability
____ Demolitions and Explosives
____ Facilities

PART IV. OPERATIONAL ASSIGNMENTS

1. Based on your past experience, rate the following areas with respect to importance in your assignment history? (1=none, 2=little, 3=some, 4=much, 5=very much)

____ Mob, C-mob, Surv
____ Facilities Engineering
____ Construction
____ Training Validation
____ Demolitions and Explosives Tng
____ Geospacial Analysis
____ Security Engineering
____ Base Camp Construction
____ Humanitarian Demining Ops
____ Engineer C2

2. Rate the following areas with respect to importance to the Objective Force as a midgrade engineer officer. (1=none, 2=little, 3=some, 4=much, 5=very much)

____ Mob, C-mob, Surv
____ Facilities Engineering
____ Construction
____ Training Validation
____ Demolitions and Explosives Tng
____ Geospacial Analysis
____ Security Engineering
____ Base Camp Construction
____ Humanitarian Demining Ops
____ Engineer C2

3. Which position better prepares engineer majors for future assignments? (1=none, 2=little, 3=some, 4=much, 5=very much)

____ SF Group Engineer
____ Battalion S3 or XO,
____ Public Works or USACE

4. Based on your understanding of the Objective Force, which position better prepares engineer majors for future assignments within the Objective Force? (1=none, 2=little, 3=some, 4=much, 5=very much)

____ SF Group Engineer
____ Battalion S3 or XO,
____ Public Works or USACE

5. Rate the following engineer specific areas on importance to the maneuver commander. (1=never, 2=seldom, 3=often, 4=frequently, 5=always)

____ Geospacial Analysis
____ Construction
____ Security Engineering
____ Operations
____ Public Works/Facilities
____ Mobility, Countermobility, Survivability
____ Demolitions and Explosives
____ Civil Military Operations
____ Intelligence Preparation of the Battlefield
____ Logistics

6. Rate the following engineer specific areas on importance within the Objective Force? (1=never, 2=seldom, 3=often, 4=frequently, 5=always)

____ Geospacial Analysis
____ Construction
____ Security Engineering
____ Operations
____ Public Works/Facilities
____ Mobility, Countermobility, Survivability
____ Demolitions and Explosives
____ Civil Military Operations
____ Intelligence Preparation of the Battlefield
____ Logistics

7. Do you consider yourself a “well-rounded” engineer, with a balanced assignment history? (1=none, 2=little, 3=some, 4=much, 5=very much)
_____

8. Is being a “well-rounded engineer important? (1=none, 2=little, 3=some, 4=much, 5=very much) _____

9. Within the following areas, how well does your assignment history support future assignments? (1=none, 2=little, 3=some, 4=much, 5=very much)

_____ Tactical
_____ Technical
_____ Other

10. Use the scale to rate the following statements. (1=none, 2=little, 3=some, 4=much, 5=very much)

_____ Tactical Proficiency is important as an Army engineer.

_____ Technical profieciency is important as an Army engineer.

_____ Technological proficiency is important as an Army engineer.

_____ Cognitive skills and abilities (numerical comprehension, oral communication, and problem solving) are important as an Army engineer.

_____ Interpersonal skills and abilities (human relations and teamwork) are important as an Army engineer.

_____ Personal characteristics, such as decisiveness and tenacity, are important as an Army engineer.

ADDITIONAL COMMENTS:

APPENDIX B

TABLES

Part I, Demographics

Table 7, Grade

	O4	O5
Count	30	6
Percent	83	17

Table 8, Gender

	Male	Female
Count	33	3
percent	92	8

Table 9, Duty Status

	Active	ARNG
Count	35	1
Percent	97	3

Table 10, Years of Federal Service

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	10-11 Yrs.	9	25.0	25.7	25.7
	12-13 Yrs.	14	38.9	40.0	65.7
	14-18 Yrs	6	16.7	17.1	82.9
	19-22 Yrs.	6	16.7	17.1	100.0
	Total	35	97.2	100.0	
Missing	System	1	2.8		
Total		36	100.0		

Table 11, Military Education

	CAS3	NR CGSC	Res CGSC	AWC
Count	1	5	29	1
Percent	3	14	81	3

Part II, Institutional Training

Table 12, Engineer Function and Institutional Training

Table 12a, Mobility, Countermobility, Survivability

	None	Little	Some	Much	Very Much
Legacy	0	3	6	47	44
Objective Force	3	13	10	39	35

Table 12b, Facilities Engineering

	None	Little	Some	Much	Very Much
Legacy	24	47	26	0	3
Objective Force	10	48	29	10	3

Table 12c, Construction

	None	Little	Some	Much	Very Much
Legacy	3	24	59	12	3
Objective Force	3	26	32	35	3

Table 12d, Training Validation

	None	Little	Some	Much	Very Much
Legacy	9	44	26	18	3
Objective Force	3	26	26	35	10

Table 12e, Demolitions and Explosives Training

	None	Little	Some	Much	Very Much
Legacy	0	12	32	41	15
Objective Force	3	10	37	30	20

Table 12f, Geospatial Analysis

	None	Little	Some	Much	Very Much
Legacy	24	44	18	9	6
Objective Force	0	6	16	39	39

Table 12g, Security Engineering

	None	Little	Some	Much	Very Much
Legacy	47	29	12	6	6
Objective Force	0	23	45	23	10

Table 12h, Base Camp Construction

	None	Little	Some	Much	Very Much
Legacy	18	44	24	12	3
Objective Force	3	23	29	39	6

Table 12i, Humanitarian Demining Operations

	None	Little	Some	Much
Legacy	56	24	15	6
Objective Force	10	29	26	35

Table 12j, Engineering Command and Control

	None	Little	Some	Much	Very Much
Legacy	3	26	29	32	9
Objective	0	6	19	48	26

Table 13, Engineer Officer Branch Specialization

	None	Little	Some	Much	Very Much
Combat Engineering	0	8	14	42	36
USACE and DPW	0	18	32	35	15
Topography	3	11	25	39	22
Combat Heavy / Construction	0	3	31	61	6
Special Operations	11	29	29	23	9

Table 14, Institutional Training and Follow-on Job Preparation

	None	Little	Some	Much	Very Much
SF Group Engineer	55	36	9	0	0
Engr Battalion S3 or XO	0	6	31	50	13
Director of Public Works	44	44	11	0	0
Deputy District Engineer	50	30	20	0	0

Part III. Self-Development

Table 15, Professional reading program

Table 15a, Number of professional books read (Count)

	0 Books	1-4 Books	5-8 Books	9-12 Books	13-16 Books	17-20 Books
History	2	26	7	0	1	0
Science	18	15	2	1	0	0
Army Doctrine	1	20	12	2	0	1
Joint Doctrine	6	24	5	1	0	0

Table 15b, Number of professional books read (Percentage)

	0 Books	1-4 Books	5-8 Books	9-12 Books	13-16 Books	17-20 Books
History	6	72	19	0	3	0
Science	50	42	6	3	0	0
Army Doctrine	3	56	33	6	0	3
Joint Doctrine	17	67	14	3	0	0

Table 16, Hours per month spent on professional development (Percent)

1-5 Hours	6-10 Hours	11-15 Hours	16-20 Hours	21-60 Hours
23	26	14	23	14

Table 17, Do you have a mentor?

	Yes	No
Percent	36	64

Table 18, Importance of self-development within the Objective Force

	None	Seldom	Some	Frequently	Always
Terrain Visualization	0	0	16	59	25
Construction	3	26	42	26	3
Security Engineering	0	23	39	29	10
Mobility, Countermobility, Survivability	0	10	29	35	26
Demolitions and Explosives	3	16	42	19	19
Facilities	6	35	35	16	6

IV. Operational Assignments

Table 19, Rate engineer functions with respect to operational assignment for both legacy and objective force requirements.

Table 19a, Mobility, Countermobility, Survivability

	Little	Some	Much	Very Much
Legacy	8	6	42	44
Objective Force	3	12	41	44

Table 19b, Facilities Engineering

	None	Little	Some	Much	Very Much
Legacy	31	31	19	8	11
Objective Force	6	53	24	15	3

Table 19c, Construction

	None	Little	Some	Much	Very Much
Legacy	3	17	28	36	17
Objective Force	0	29	32	38	0

Table 19d, Training Validation

	None	Little	Some	Much	Very Much
Legacy	3	14	31	36	17
Objective Force	0	12	38	26	24

Table 19e, Demolitions and Explosives Training

	None	Little	Some	Much	Very Much
Legacy	0	22	28	28	22
Objective Force	3	29	24	29	15

Table 19f, Geospatial Analysis

	None	Little	Some	Much	Very Much
Legacy	14	31	31	14	11
Objective Force	3	6	15	38	38

Table 19g, Security Engineering

	None	Little	Some	Much	Very Much
Legacy	17	47	19	8	8
Objective Force	0	29	44	9	18

Table 19h, Base Camp Construction

	None	Little	Some	Much	Very Much
Legacy	22	28	17	25	8
Objective Force	3	12	59	21	6

Table 19i, Humanitarian Demining Operations

	None	Little	Some	Much	Very Much
Legacy	42	28	19	11	0
Objective Force	3	32	41	18	6

Table 19j, Engineer Command and Control

	Little	Some	Much	Very Much
Legacy	14	19	42	25
Objective Force	6	12	50	32

Table 20a, Legacy Force position that best prepares engineer majors for future assignments:

	None	Little	Some	Much	Very Much
SF Group Engineer	3	24	53	18	3
Battalion S3 or XO	0	0	3	33	64
DPW or USACE	6	6	30	55	3

Table 20b, Objective Force assignments that best prepare engineer majors for future assignments?

	None	Little	Some	Much	Very Much
SF Group Engineer	0	21	53	21	6
Battalion S3 or XO	0	0	15	39	45
DPW or USACE	15	24	33	27	0

Tables 21, Engineer function importance to the maneuver commander (Legacy vs Objective Force)

Table 21a, Geospacial Analysis

	None	Little	Some	Much	Very Much
Legacy	6	9	14	37	34
Objective Force	3	3	18	24	52

Table 21b, Construction

	None	Little	Some	Much	Very Much
Legacy	9	40	31	14	6
Objective Force	6	48	18	21	6

Table 21c, Security Engineering

	Little	Some	Much	Very Much
Legacy	26	38	26	9
Objective Force	28	38	28	6

Table 21d, Operations

	None	Little	Some	Much	Very Much
Legacy	3	0	17	40	40
Objective Force	0	3	15	36	45

Table 21e, Public Works / Facilities

	None	Little	Some	Much
Legacy	23	40	29	9
Objective Force	21	42	24	12

Table 21f, Mobility, Countermobility, Survivability

	Little	Some	Much	Very Much
Legacy	0	3	43	54
Objective Force	3	18	27	52

Table 21g, Demolitions and Explosives

	None	Little	Some	Much	Very Much
Legacy	3	14	40	37	6
Objective Force	0	18	42	27	12

Table 21h, Civil Military Operations

	Little	Some	Much	Very Much
Legacy	17	34	43	6
Objective Force	9	48	33	9

Table 21i, Intelligence Preparation of the Battlefield

	Some	Much	Very Much
Legacy	20	46	34
Objective Force	9	48	42

Table 21j, Logistics

	Little	Some	Much	Very Much
Legacy	9	26	40	26
Objective Force	3	30	42	24

Table 22, Well-rounded engineer

	None	Little	Some	Much	Very Much
	3	22	39	25	11

Table 23, Is being a "well-rounded" engineer important?

	Little	Some	Much	Very Much
	17	31	28	25

Table 24, How well does your assignment history support future assignments?

	None	Little	Some	Much	Very Much
Tactical	3	8	11	36	42
Technical	0	30	30	24	15
Other	9	4	26	48	13

Table 25, Importance to Army Engineer Officers

	Little	Some	Much	Very Much
a. Tactical proficiency	0	6	22	72
b. Technical profieciency	0	11	42	47
c. Technological proficiency	8	11	42	39
d. Cognitive skills and abilities (numerical comprehension, oral communication, and problem solving)	0	3	31	67
e. Interpersonal skills and abilities (human relations and teamwork)	0	8	42	50
f. Personal characteristics, such as decisiveness and tenacity	0	11	36	53

APPENDIX C

RECOMMENDATIONS FOR FURTHER RESEARCH

During research several areas warrant further development and may have significant impact on the Corps of Engineers. First is the importance of professional engineering registration as an engineer officer to include assessing only degreed engineers into the branch. Secondly, should each service maintain their own engineer branch or should the Department of Defense consider combining Army engineers, Navy Seabees, and Air Force REDHORSE units into a joint engineer effort. Finally, what is the recommended career path for officers under the new OES to ensure well-rounded, professionally developed engineer officers for the Objective Force.

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